

# Center for Domestic Preparedness (CDP) CBRN Program Update Project

Terrence K. Cloonan  
NPPTL, NIOSH, CDC, DHHS

## OBJECTIVES

- NIOSH NPPTL assists the CDP in the inter-agency development of guidelines for the initial use and defined reuse of NIOSH-approved CBRN air-purifying respirators (APR) to support COBRATF training objectives.
- NIOSH NPPTL & the CDC NCEH EPHRB provide public health assistance per inter-agency agreement (IAA).

## EXTERNAL STAKEHOLDERS

- DHS, FEMA, Center for Domestic Preparedness (CDP), Anniston, Alabama
- United States Army Edgewood Chemical Biological Center, Aberdeen Proving Ground, MD
- United States Army Material Command, Pine Bluff, Arkansas
- United States Army Chemical Materials Agency, Edgewood Area, Aberdeen Proving Ground, MD
- United States Army Public Health Command, Edgewood Area, Aberdeen Proving Ground, MD

## STAKEHOLDER RESEARCH to PRACTICE (r2p) PARTNER

- Centers for Disease Control and Prevention, National Center for Environmental Health (NCEH), Division of Emergency Environmental Health Services, Environmental Public Health Readiness Branch (EPHRB), Chemical Weapons Elimination Team, Atlanta, Georgia



Figures 1a, 1b, and 1c: Examples of respiratory protective devices in use at the CDP. Left to right, clockwise from above: 1a - CDP dual use facepiece with APR industrial filters. 1b - CDP students in Level B with APR adapters for Level C. 1c - CDP APR configuration with P100 filter.

## Background

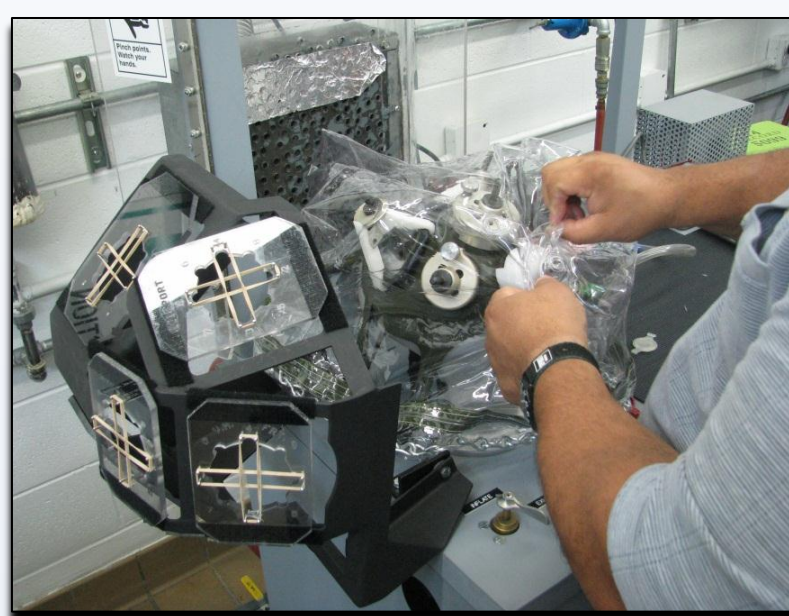
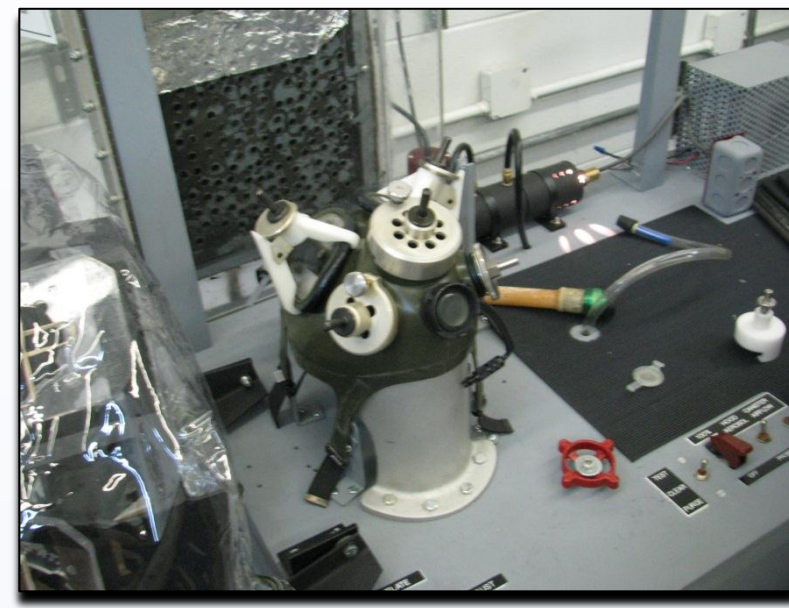
- **Emergency Responders:** Since 2001, CDP has trained 41,670 personnel in toxic chemical warfare agent training at the chemical, ordnance, biological, radiological training facility (COBRATF), Anniston, AL.
- **COBRATF Mission:** Allow responder students to gain self confidence in the use of assigned personal protective equipment (PPE) and demonstrate individual proficiency while providing an ability to conduct survey, down casualty rescue, and emergency response activities in a controlled toxic training environment.
- **COBRATF PPE:** Military-specified (mil-spec) gas mask air-purifying respirator (APR) with two-piece suit.
- **PPE Reuse Protocol:** The current CDP reuse protocols are based on U.S. Army chemical surety oversight use of PPE in secure training bays that have air-sampling and monitoring engineering controls integrated. The training bay air-sampling criteria limits are based on 1988 CDC airborne exposure limits (AEL) and CDP COBRATF specific maximum concentration limit (CMCL) values. To protect responders and workers in these secure live-agent training bays, mil-spec APR with C2A1 canisters and carbon-based protective suit postures, with and without butyl aprons, are used for a specified number of training trials. PPE quality control is maintained with the use of mil-spec replacement parts, protective mask leak test instruments, quantitative and qualitative respirator fit test equipment and methods, and adapted U.S. Army chemical surety decontamination and laundry reuse policies.
- **Transition to DHS Recognized CBRN PPE:** The continued use of mil-spec PPE is not a desired option. CDP requires a phased transition from mil-spec PPE to NIOSH-approved CBRN APR and next generation chemical-biological protection rated ensembles, preferably NFPA-compliant ensembles.
- **Status:** In May of 2011, CDP and CDC entered into an interagency agreement asking for CDC assistance in the areas of CBRN respirator selection criteria, creation of respirator reuse clearance values, validation of vetted decontamination methods, and PPE leak/fit test pass-fail criteria to allow the development of new or enhanced procedures and policies for the decontamination and reuse of pristine NIOSH-approved CBRN APR.

## Development of CBRN PPE Reuse Protocols with 2003/2004 AEL Values



Figure 2: Mil-spec gas mask undergoing M14 leak test.

- **Worker Safety:** Mil-spec gas masks and suits are not representative of what the responder wears currently for all-hazard/WMD/CBRN incident response. Select brands of NIOSH-approved CBRN APR are listed in the NFPA 1994 standard, 2012 edition.
- **Exemption Status:** CDC 1988 AEL values are currently used under the authorization of a U.S. Army modeled exemption letter issued by DHS to FEMA. When the CDP transitions to commercially available CBRN PPE, its DHS exemption will expire.
- **CDC 2003/2004 AEL Values:** CDC ATSDR Environmental Public Health Readiness Branch (EPHRB) chemists, partnering with ECBC CASARM personnel, will assist the COBRATF staff in updating the air-monitoring program to the 2003/2004 AELs.
- **CBRN APR:** Select respirators will have to pass similar mil-spec M14 leak tests to validate reusability.



Figures 3a, b, & c. 3a: PC&E "Ready-Racks" of reconditioned gas masks & suits. 3b & 3c: Use of M14 and mask.

## IAA Tasks Specific to NIOSH NPPTL

- **TASK # 1: NIOSH NPPTL – Respiratory and Protective Ensemble Selection**
  - Provide assistance to the CDP in creating respirator selection criteria and evaluation of commercially available NIOSH-approved CBRN respirators and their integration with NFPA-compliant ensembles.
  - Assist the CDP and EPHRB in reviewing test data and addressing procedural gaps in ASTM man-in-simulant testing (MIST) procedures utilized in the evaluation of protective ensembles.
  - EPHRB will provide certified industrial hygiene technical review and the joint-development of scientific definitions created for the respirator reuse, health-screening value(s) policy applicable to the isolated populations similar to the students and staff of the CDP.
- **TASK # 2: EPHRB – Air-Monitoring Program Update:** See IAA.
- **TASK # 3: EPHRB and NIOSH NPPTL – Development of CDP Site-Specific Reuse Procedures**
  - As necessary, NPPTL provides supplemental technical support in the development of CDP concept and final standard test procedures for the decontamination and reuse of newly-acquired NIOSH CBRN APR.
  - NPPTL will provide technical assistance in the selection of next generation respirator leak test and fit testing instruments and methods to improve the COBRATF's respiratory protection program.
  - As required, EPHRB & NPPTL will assist in developing new procedures and identifying external auditors.
- **TASK # 4: EPHRB and NIOSH NPPTL – CBRN Program Assessment and Enhancement**
  - EPHRB, with assistance from NPPTL, will conduct comprehensive review of all practices and procedures impacted by the project's updates and implement practical solutions without adversely impacting training.

## Research Completed

- **Task # 1: NIOSH NPPTL - Respiratory and Protective Ensemble Selection**
  - **Selection Criteria:** NIOSH-approved CBRN APR listed in NFPA 1994:2011 are vetted with CDP. Discussions regarding future ECBC MIST evaluations of NFPA 1994:2012 ensembles is underway.
  - **Training Surveillance:** Benchmark observations of how mil-spec PPE is actually used in the CDP and CDP COBRATF was completed by NIOSH in July, August, and September timeframes of 2011. A NIOSH FTE civil servant from NPPTL successfully graduated from three CDP resident courses to include completion of COBRATF GB and VX toxic agent training using mil-spec nuclear, biological, and chemical PPE that included M40A1, C2A1, LANX, butyl gloves, and issued protective boots; similar to mission oriented protective posture-4 (MOPP-4)/"Level-C equivalent".
  - **Feasibility:** On November 12, 2011, NIOSH NPPTL determines the CDP's September 29, 2011 request to reuse NIOSH-approved CBRN APR technology, while retaining NIOSH-certification over a defined period of controlled toxic agent vapor training events is feasible, provided all concerned agencies have the opportunity to review available exposure scientific data prior to the creation of final reuse and decontamination protocols designed to provide identified worker protection levels.
  - **Protective Clothing & Equipment (PC&E) Section:** Inaugural NIOSH-CDC visit of the COBRATF protective clothing & equipment (PC&E) reconditioning section completed on November 14, 2011.

## Envisioned End-State of Completed Tasks

- **COBRATF:** NIOSH-approved CBRN APR replace all existing gas mask technologies currently in use. CDP provides attending emergency responder students with a selection of respiratory and dermal personal protective technologies that are compliant to the NIOSH-approved CBRN statement of standards and U.S. federal or national consensus specifications for chemical-biological protective ensembles that include interoperable CBRN respirators and OSHA-NFPA listed suits, gloves, & boots. COBRATF enhances worker and trainee protection by maintaining the scientific and engineering capacity to demonstrate repeatable quality control measures and actions that validate interagency protocols to allow the safe initial use and subsequent reuse of specific PPE in accordance with all concerned federal agencies. An end-state is the creation of final CDP-CDC respirator/PPE use, reuse, & decontamination protocols.
- **NIOSH/NPPTL:** NIOSH-approved CBRN APR selected by the CDP are successfully evaluated for satisfactory interoperability with one or more protective ensembles selected by CDP for COBRATF training operations. As of November 3, 2011, a size tariff of NFPA 1994: 2012 edition CBRN PPE is on-order by NIOSH for use in completing IAA tasks 1 and 3.
- **NIOSH TC Numbers - CBRN APR with Cap 1 Canister:** NIOSH technical certification (TC) numbers are issued to specific CBRN APR approval holders meeting the published specifications of DHS FEMA CDP COBRATF reuse standards & quality control methods.



Disclaimer: The findings and conclusions in this poster have not been formally disseminated by NIOSH and should not be construed to represent any agency determination or policy, as of March 5, 2012.